PPH-1503

Programmable High Precision D.C. Power Supply

FEATURES

- Dual Range Output (0~15V/ 0~3A or 0~9V / 0~5A) ; Output Power 45W
- 3.5 Inch TFT LCD Display
- Constant Voltage and Constant Current Operation
- Built-in DVM Measurement Function
- High Measurement Resolution (1mV/0.1mA for 5A Range) ; (1mV/0.1μA for 5mA Range)
- External Relay Control Output On / Off
- Sink Current Capability (Maximum : 2A)
- Digital Panel Control
- Selectable Output and Input (DVM) Ports From Front or Rear Panel
- Key Lock Function
- 5 Sets of Preset Memory Including Power Output ON/OFF States
- High Speed Transient Recovery Time (< 40μS within 100mV ; < 80μS within 20mV)
- OVP/OCP/OTP Protection to Prevent DUT Damage
- Standard Multiple Interfaces : USB / LAN / GPIB
- LabView Driver and PC Remote Control Software

GW INSTEK

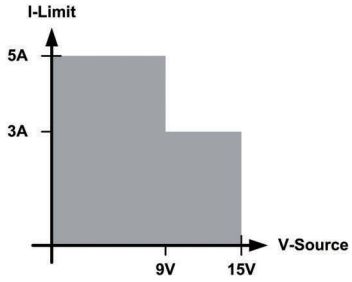
Simply Reliable

Swift Responses with Accurate Measurement

PPH-1503 is a high-speed and high-precision DC Power Supply with Dual Range of 15V/3A or 9V/5A. PPH-1503 is exclusively designed to meet low power consumption requirements and users' great demands of accuracy, speed and resolution of both voltage and current. Circuits are designed with swift response capability to provide a stable voltage output while experiencing load changes. For example, when switching cellular phone from standby to talk mode, the current consumption will be dramatically changed within milliseconds. When load current exceeded current limit, two operational modes: Limit and Trip can be selected. Under Limit mode, PPH-1503 will automatically switch to constant current (CC) mode. Under Trip mode, voltage output will automatically turn off.

PPH-1503 is designed to provide prompt response to the current change for recovering the output voltage at a minimum variation. The high sampling rate allows fast readback in voltage and current measurement to expedite products' testing speed, which is able to increase the test throughput of production. Sink function can be used to test the battery charger of portable devices. The high precision performance of PPH-1503 provides the measurement capability in low power consumption level. One built-in DVM (Digital Volt-Meter) with input ports is designed to measure any point on DUT while PPH-1503 is outputting voltage and current. Besides, two ports are located on the front and rear panel which users can only select one to perform tests based upon their connection convenience. PPH-1503 is an ideal power source for production lines, R&D laboratories, device inspection, maintenance centers or facilities with the requirements of a swift and precise power supply with DVM.

A. DUAL RANGE OPERATION



Dual Range Operation

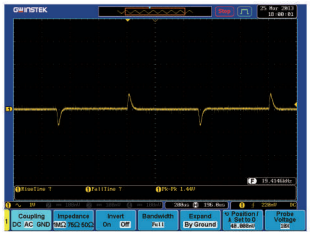
PPH-1503 operates as a generic power supply with the ability to display different current ranges from 3A range with 0~15.0V output to 5A range with 0~9.0V output totally for 45W output capacity.

B. ACCURATE LOW CURRENT MEASUREMENT

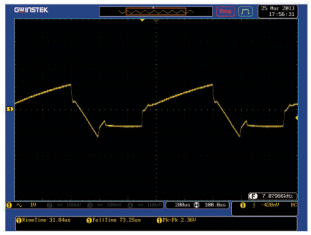
0.1μA Resolution

PPH-1503 provides 0.2%+1μA readback accuracy and 0.1μA resolution for high precision of current measurement. For example, when portable device works in the sleep or standby mode, the current is drawn at a low level. The low current consumption under standby or sleep mode can be measured accurately.

C. FAST RESPONSE TO LOAD AND VOLTAGE CHANGES



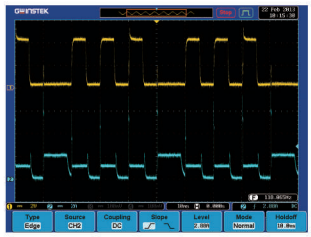
PPH-1503



Conventional Power Supply

When DUT such as cellular phone switches to idling, receiving or transmitting mode, the current drawn from power supply changes over tenfold. The sudden current change will cause the supplied voltage to drop as well. The conventional power supply is considered a dull device since it will take several milliseconds for the dropped voltage to return to the original level. PPH-1503 is designed to simulate battery response when a significant voltage drop occurs. Recovery time of 40μs or less is guaranteed when the maximum voltage drop is within 100mV. Moreover, when users change the voltage level and conventional power supply does not have sufficient speed to reach the set level, PPH-1503 provides rise time of 0.15ms and fall time of 0.65ms, which are hundreds times faster than that of the conventional power supplies.

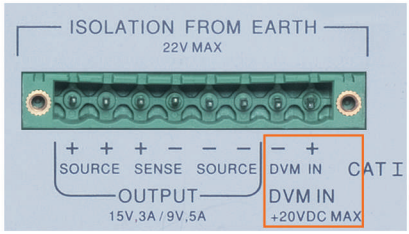
D. MEASUREMENTS FOR POWER CONSUMPTION ANALYSIS



Voltage and Current Waveforms of the Receiving Signals of a Cellular Phone

One particular requirement of power consumption for portable wireless communications devices is Pulse Current. Portable devices such as cellular phones must transmit and receive (detect) signal periodically by drawing pulse current instead of constant current from battery to ensure devices' sound connection in network. To analyze the transient power consumption of a DUT, the peak of short pulse current and average current measurements over a long period of time are crucial. PPH-1503 provides pulse current and long integration functions, the former can measure the peak value of a pulse, the latter can measure the average value of pulses. PPH-1503 provides DUT with pulse current measurement and analyzes the transient power consumption to qualify the device for specified power consumption requirements.

E. BUILT-IN DIGITAL VOLTMETER (DIGITAL VOLT-METER)



Rear Panel of the PPH-1503

Front Panel of the PPH-1503

PPH-1503 contains a built-in auxiliary DVM (Digital Volt-Meter) with dedicated input ports located on both front and rear panel. Consequently PPH-1503 not only provides power source for DUT but also measures the voltage from any point on the circuit of DUT. The accuracy of DVM measurement is the same as readback accuracy. Both DVM ports can be remotely controlled by SCPI commands via a PC. The built-in DVM function widely supports various voltage applications, therefore, users DO NOT have to purchase extra voltage meters.

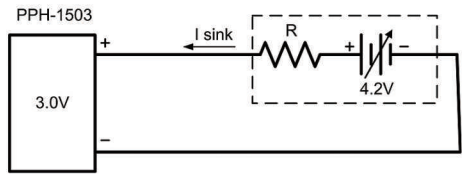
F. SELECTABLE FRONT/REAR PORTS FOR POWER OUTPUTS AND DVM INPUTS

Front Panel of PPH-1503 (Output Terminal)

Rear Panel of PPH-1503 (Output Terminal)

Either front or rear panel provides power supply output and DVM input ports for users' connection consideration. The above-mentioned panels can only be used one at a time. Therefore, this special feature of PPH-1503 not only fits in production lines but also is widely used for R&D laboratories, device inspection or maintenance centers.

G. SINK OPERATION

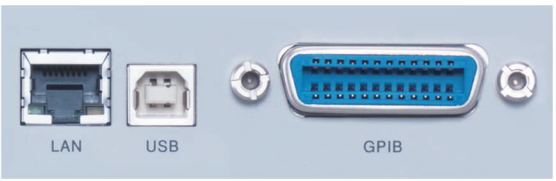


Current Sink Connection

Chargers are often attached to portable battery operated devices. PPH-1503 can sink current, acting as an electronic load, and simulate discharged function of rechargeable batteries. The maximum current is up to 2A. Users can test either battery charged or discharged without changing test equipment.

Note : R is internal resistance of the battery for DUT devices.

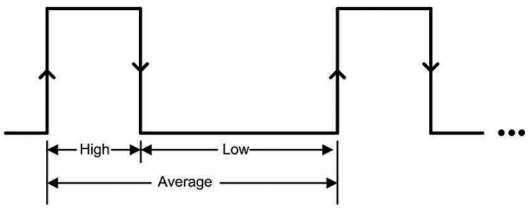
H. MULTIPLE PC REMOTE INTERFACES



Multiple PC Remote Interfaces

PPH-1503 can be connected via USB, GPIB and LAN for remote control by using SCPI commands.

I. PULSE CURRENT MEASUREMENTS



The Time Specified for the Measurement

PPH-1503 DC power supply can perform current measurements for pulsing loads. Its several built-in measurement modes include :

- High Measured Current-measure the peak current of the pulse train.
- Low Measured Current-measure the low current of the pulse train.
- Average Transmit Current-measure the average current of the pulse train.

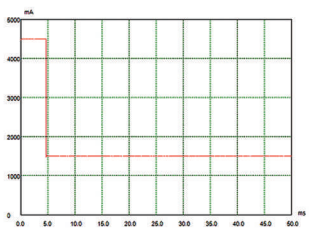
The high, low, and average measurements of a pulse are illustrated as follow :

To avoid false pulse detection, users can use a trigger level of up to 5A. All pulses, noise or other transients that are less than set trigger level will be ignored. The manual integration time range setting is 33 us to 833,333 us.

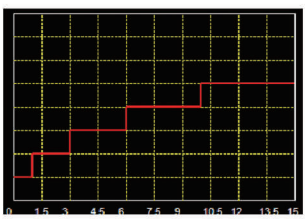
Pulse current measurement can measure transient current consumption to provide the information for the allocation of power supply system for products' preliminary design, i.e. power supply circuits, battery selections for clients' product analyses. Portable communications products, i.e. RF modules and designs based upon blue tooth system can better use pulse current measurement function.

Long integration is an average current measurement of one or more pulses. A pulse edge can be used to trigger the start of a measurement. The long integration time period must be a full period or integer multiples of a complete period of the measured pulse current and can be set to a maximum of 60 seconds. Long integration analyzes products' overall power consumption at a certain period of time, for instance, measuring the power consumed from beginning to the end of a phone call for a cellular phone so as to analyze all parameters of RF module.

J. PC-SOFTWARE



Pulse Current Measurement



Program Editing

Users can remotely control PPH-1503 by particular PC software, in which several functionalities are included : voltage/current output control, voltage measurement, pulse current measurement and long integration.

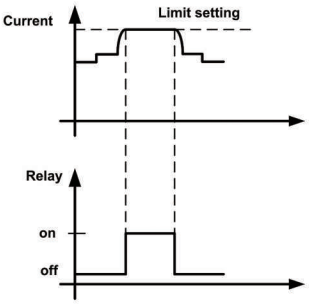
To augment the original functions, waveform display function of pulse current measurement and voltage output program function are also brought into the functionality list. The former displays waveforms of measured pulse current on the computer screen. The latter allows users to produce waveforms of predetermined voltage output by programming which can be set to the maximum steps of 20 and each step is 1ms to the fastest. PC software can be downloaded from GW Instek website.

PANEL INTRODUCTION

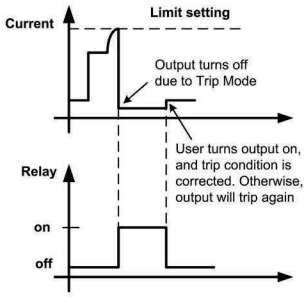
CE | USB Host | PC Software | LAN | GPIB | LabVIEW Driver

1. LCD Display
2. Operation Keys
3. Voltmeter Terminals (DVM)
4. Function Keys
5. Output Terminals (SOURCE and SENSE)
6. Power On/Off Switch
7. Rear Panel Outputs and DVM Inputs
8. External Relay Control Port
9. LAN Port
10. USB Port
11. GPIB Port

K. EXTERNAL RELAY CONTROL

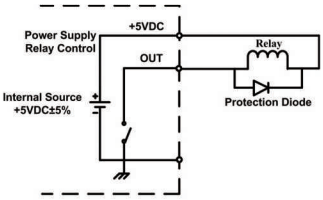


Limit Relay



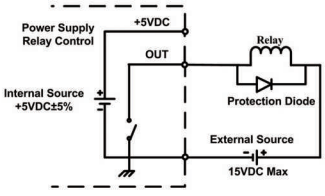
Trip Relay

Relay Can be Driven by Using Internal +5V or External Power Source :



+5VDC Relay Output

Using the +5VDC relay output to drive an external relay. Ensure the current does not exceed 150mA.



External Power Source

Using an external power source to drive the external relay. The voltage of the source can not exceed 15V and the current can not exceed 150mA.

PPH-1503 provides Limit relay and Trip relay modes and is equipped with corresponding output ports, in which output signals control external relay. Under Limit relay mode and the current limit is reached, PPH-1503 will switch from Constant Voltage to Constant Current automatically. Under "Trip relay" mode and the current limit is reached, PPH-1503 will turn output off. Furthermore, External Relay control can be used if users simultaneously use other devices for test system. When "Limit Relay" mode is selected and the current limit is reached, External Relay control signal will go high and will return back to the low level when the current level goes back below the constant current setting. When "Trip Relay" mode is selected and the current limit is reached, the relay control signal will go high and the output is disabled. When the output goes back on and the current is less than the current setting, the relay control signal will back to the low level. Users can use relay control signal to control other devices for test system.

SPECIFICATIONS

OUTPUT	Number of Channel	1
	Voltage Rating	0 ~9V/5A ; 0~15V/3A
	Current Rating	0 ~ 5A (Low Range : 9V); 0 ~ 3A (High Range:15V)
	Power Rating	45W
	Output Voltage Rising Time	0.15ms (10% ~ 90%)
	Output Voltage Falling Time	0.65ms (90% ~ 10%)
STABILITY	Voltage	0.01%+0.5mV
	Current	0.01%+50 μA
REGULATION (CV)	Load	0.01%+2mV
	Line	0.5mV
REGULATION (CC)	Load	0.01%+1mA
	Line	0.5mA
RIPPLE & NOISE (20Hz ~ 20MHz)	CV p-p	8mV
	CV rms	1mV
PROGRAMMING ACCURACY	Voltage	±(0.05%+10mV)
	Current	±(0.16%+5mA)
READBACK ACCURACY	Voltage	±(0.05%+3mV)
	Current (5A Range)	±(0.2%+400 μA)
	Current (5mA Range)	±(0.2%+1 μA)
RESPONSE TIME (RESPONSE to 1000% LOAD CHANGE)	Transient Recovery Time	< 40 μS within 100mV < 80 μS within 20mV
PROGRAMMING RESOLUTION	Voltage	2.5mV
	Current	1.25mA
READBACK RESOLUTION	Voltage	1mV
	Current (5A Range)	0.1mA
	Current (5mA Range)	0.1 μA
PROTECTION FUNCTION	OVP Accuracy	50mV
DVM	DC Read Back Accuracy (23℃± 5℃)	±0.05%+3mV
	Read Back Resolution	1mV
	Maximum DC Differential Voltage	0 ~ 20VDC
	Input Resistance and Capacitance	100000MΩ
PULSE CURRENT MEASUREMENT	Trigger Level	5mA ~ 5A, 5mA/Step
	High Time/low Time/average Time	33.3us to 833ms, 33.3us/Step
	Trigger Delay	0 ~ 100ms,10us/Steps
	Average Readings	1 ~ 100
	Long Integration Pulse Timeout	1S ~ 63S
	Long Integration Measurement Time	850ms(60Hz)/840ms(50Hz) ~ 60s, or Auto time 16.7ms/Steps(60Hz), 20ms/Steps(50Hz)
	Long Integration Trigger Mode	Rising, Falling, Neither
OTHER	Output Terminal	Front/Rear Panel
	DVM Input	Front/Rear Panel
	Relay Control Connector	150mA/15V 5 Voutput, 100mA
	Operation Temperature	0 ~ 40°C
	Operation Humidity	≤ 80%
	Storage Temperature	-20°C ~ 70°C
	Storage Humidity	< 80%
PC REMOTE INTERFACES	Standard	GPIB/USB/LAN
PC SOFTWARE & LABVIEW DRIVER	Free	PC Software/Labview Driver
CURRENT SINK CAPACITY	Sink Current Rating	2A(Vout≦5V); 2A-0.1x(Vout-5)(Vout>5V)
MEMORY	Save/Recall	5 Sets
POWER SOURCE	Inpout Power	90 ~ 264VAC ; 50/60Hz
	Power Consumption	150VA
DIMENSIONS & WEIGHT		222(W) x 86(H) x 363(D) mm; Approx 4.2Kg

Specifications subject to change without notice. PH-1503GD1BH

ORDERING INFORMATION

PPH-1503 Programmable High Precision DC Power Supply

ACCESSORIES

User Manual (CD) x 1, Quick Start Guide x 1, Power Cord x 1 (Region Dependent)
GTL-117 Test Lead (10A Maximum), GTL-204A Test Lead(10A Maximum),
GTL-203A Test Lead (3A Maximum)

OPTIONAL ASSESSORIES

GTL-248	GPIB Cable (2.0M)
GTL-251	GPIB-USB-HS(High Speed)
GTL-246	USB Cable (USB 2.0, A-B Type)

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